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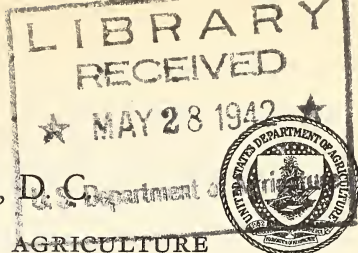
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## Low-Priced Milk and the Consumption of Dairy Products Among Low-Income Families, Washington, D. C., 1940

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### EXPERIMENTS IN MILK MARKETING

During the fiscal year 1940-41 thousands of low-income families in six cities got extra milk because they could buy it at a special low price. This low-priced-milk program is made possible through Government subsidy and other arrangements, and is one of many efforts now being made to enlarge our domestic market for farm products and to improve the diet and health of needy persons.

Many low-income city families have so little money for food that they cannot buy the milk they need for nutritionally adequate diets. As a rule, families on relief get less milk than self-supporting families. This is not from choice. Relief and nonrelief groups differ but little in their consumption of milk products when they have about the same

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amounts to spend for food. The experimental milk-marketing programs are being developed with the idea that low-income groups may greatly increase their purchases of milk if given the chance to buy it at a price markedly below the prevailing retail level.

Low-priced-milk programs are operated under the provisions of section 32 of Public Act No. 320, Seventy-fourth Congress, approved August 24, 1935. An amendment to this section, approved June 30, 1939, authorized the Secretary of Agriculture to encourage the domestic consumption of agricultural commodities or products "by increasing their utilization through benefits, indemnities, donations or by other means among persons in low-income groups as determined by the Secretary of Agriculture."

In 1940-41 relief milk programs were serving low-income families in Boston, Chicago, New Orleans, New York, St. Louis, and Washington, D. C. The details of their operation differ somewhat from city to city, since the programs still are in the experimental stage, but the general principles are the same everywhere and are about as follows: For all of the milk sold under the program farmers accept from handlers a price that is lower than for milk to be sold in fresh fluid form in the regular market. The price is higher, however, than for milk to be converted into manufactured products, such as evaporated milk, cheese, or butter. Milk distributors bid competitively for the business of supplying the milk to families. They receive the amount per quart paid by the families plus an indemnity payment per quart made by the Surplus Marketing Administration of the United States Department of Agriculture; receipts from these two sources reimburse the handler for the milk and the necessary services of pasteurization, bottling, and distribution. Only families certified as eligible by public authorities may buy this milk at the special price.

Low-priced milk became available in Washington, D. C., on August 12, 1940. The milk is sold for 5 cents a quart at special distributing stations. Most of these are open from 2 to 5 p. m. daily except Sunday and holidays. Provision is made for the regular inspection of the relief milk. It must meet all local health requirements. In butterfat content, too, it must meet local regulations. The milk is pasteurized, bottled in 1-quart glass bottles, and is kept iced at a proper low temperature. In buying the milk the purchaser makes a 3-cent deposit on the container, which is refunded upon return of the empty bottle.

The group eligible to buy the 5-cent milk includes persons or families receiving assistance from or through a public relief agency and families of persons certified for employment under the Work Projects Administration, but awaiting assignment or found to be unassignable to such employment. In order to participate in the program they must be certified as eligible by the Board of Public Welfare. All eligible persons receive letters describing the program and inviting participation. In turn they must reply by filling in and returning an enclosed form, whereupon they receive a certification card which identifies them at the milk station.

The maximum quantities of milk that may be purchased under the program allow 1 pint per day for every person under 17 years of age, for every expectant or nursing mother, and for unattached persons, and one-half pint per day for all other persons over 17 years of age. Special diet cases needing more than these quantities of milk are



permitted to purchase more. If the calculated family allowance includes a fraction of a pint, the quantity allowed is raised to the next whole pint. Participants may double their milk purchases on the day before or the day after Sunday and holidays when the stations are closed.

The United States Department of Agriculture is concerned with the effect of its special programs of food distribution on incomes of farmers and on the dietary levels of disadvantaged consumers. The study reported in this publication was undertaken by the Bureau of Home Economics in cooperation with the Bureau of Agricultural Economics to determine the effect of the low-priced-milk program upon the consumption of fluid milk and other dairy products among selected groups of eligible families living in Washington, D. C. The results are of interest to nutritionists, specialists in marketing, administrators, milk producers, and milk distributors.

## DESCRIPTION AND APPRAISAL OF THE STUDY

From a sample of families eligible to participate in the program, information was obtained concerning the consumption of dairy products during 1-week periods (1) prior to the inauguration of the plan and (2) after the 5-cent milk had become available. The pre-program survey was made in May and June 1940. The 5-cent milk went on sale August 12, 1940. The follow-up survey was made in October and November 1940, starting when the program had been in operation less than 2 months. Although the proportion of eligible families participating in the program increased somewhat as the months passed, no available information indicates any significant shift in the average quantities of fluid milk purchased by participating families.

Approximately 8,500 family groups and unattached persons were eligible to participate in the Washington, D. C., low-priced-milk program when it was begun in August 1940. These included about 6,400 recipients of direct relief of which 3,600 were receiving old-age assistance or aid to the blind. An additional 2,100, including an unknown number of persons living alone, were certified for WPA employment but were waiting for jobs. During August, the first month of the operation of the plan, only about one-fourth of the eligible group took advantage of their opportunity to buy 5-cent milk. The proportion of eligible families participating in the program increased, however, during the first year of its operation. During September, the proportion increased to one-third. In March 1941, about two-fifths of the eligible families were believed to be participating; in July and August 1941, somewhat fewer than three-fifths.

The time and funds available for the study made it necessary to limit the scope of the investigation, both by omitting certain eligible groups and by defining certain geographical boundaries. The following areas of the District of Columbia were included: (1) The southwest, bounded on the north by the Mall; on the east, by South Capitol Street; on the south, by the Anacostia River; and on the west, by the Washington Channel; (2) a section in the southeast bounded on the north by East Capitol Street; on the east and south, by the Anacostia River; and on the west by South Capitol Street; and (3) a section in

the northeast bounded on the north by Rhode Island Avenue to Fifth Street, Fifth Street to New York Avenue, New York Avenue to the Anacostia River; on the east, by the Anacostia River; on the south, by East Capitol Street, and on the west by North Capitol Street. These areas were known to include a fairly high proportion of families eligible for participation in the low-priced-milk program.

The sample included every eligible family living in areas described above that was composed of two or more persons (with at least one adult) and that was receiving general public assistance or aid to dependent children, or that included a family member certified for work under the Work Projects Administration but not employed (awaiting assignment to a job or found to be unassignable for some reason). The study did not include one-person families or persons receiving old-age assistance or aid to the blind. These individuals were omitted because they often have part of their meals with families who are not eligible for the program. This circumstance would interfere with obtaining the information desired on the consumption of dairy products other than low-priced fluid milk. In addition it would add greatly to the cost of field work to locate and interview unattached persons who might be job-hunting or otherwise occupied during the customary hours of field work. Furthermore, though a family group and an individual may each count as one eligible case, families of two or more persons represent the bulk of the low-income population to be served by the milk program. Names and addresses of eligible families were obtained through the Board of Public Welfare and the Work Projects Administration.

Through interviews with a responsible adult member of each family, preferably the homemaker, field agents ascertained the desired facts. These included estimates of the quantities of milk and milk products used during the 1-week period preceding the interview and the prices paid for these foods, if purchased. The products listed on the schedule were: Whole milk; skim milk; buttermilk; chocolate milk; evaporated milk; sweetened condensed milk; dry skim milk; cream; ice cream; cheeses; butter; and oleomargarine. In addition, each family was asked for facts concerning household composition, receipt of surplus foods, and money expenditures for food during the week preceding the interview. A few families were unable to estimate their total food expenditures during the week; their schedules were accepted if all other information was satisfactorily supplied. The interview was conducted in accordance with carefully prepared instructions and the facts were recorded on uniform schedules. (See Appendix, p. 26.)

In the course of the preprogram survey, 1,129 families were interviewed. Of these, 1,101 families gave the information desired; 11 were unable, though willing, to give the information; and 17 refused to cooperate. In the second or program survey, 959 families were interviewed; 951 cooperated; 4 were unable to supply the data; and 4 refused. In the first inquiry, 67 percent were recipients of direct relief and in the second, 78 percent; the rest were waiting for WPA jobs. In each survey about one-third of the families interviewed were white, and two-thirds were Negro.

Not all families included in the preprogram survey could be interviewed in the course of the inquiry made after the program had been set into operation. The relief status of some had changed so that they

were no longer eligible for the 5-cent milk; others had moved away from the areas surveyed. However, some families were included in the second survey that had not been interviewed in the preprogram period; during the intervening months some additional families had become eligible to buy 5-cent milk, and other eligible families had moved into the areas included. A schedule was filled in each survey for 624 identical families. Of this less mobile group, 88 percent were receiving direct relief; only 12 percent were waiting for WPA jobs.

In the analysis of the data comparing preprogram consumption of dairy products with consumption after the program was in operation, households were grouped in three ways—all households interviewed in each period, identical households interviewed in both periods, and households interviewed in but one of the periods. In general, the conclusions that can be drawn from the data are similar regardless of the manner in which schedules are grouped for analysis, as may be seen from table 8 in the Appendix. For the sake of simplicity and clear-cut analysis, all tables but the one just noted as well as all of the discussion in the text of this report are based on data obtained from the 624 identical families that cooperated in both surveys by giving the information requested.

The over-all results of this report cannot be extrapolated to represent the city of Washington as a whole, inasmuch as the study excluded individuals living alone, as well as those receiving old-age assistance and aid to the blind. It seems likely that infirm, handicapped, or unemployed adults would consume less milk than persons living in family groups, and that relatively fewer would take advantage of the low-priced-milk program than would families—especially families with children. Furthermore, the racial difference found in consumption of dairy products also would have to be considered in generalizing from the findings presented.

## PURCHASE AND CONSUMPTION OF FLUID WHOLE MILK

Of the 624 identical families cooperating in both surveys, 192 were white and 432 Negro. About half of each group—102 white and 219 Negro families—were taking advantage of their opportunity to buy milk at 5 cents a quart at the time of the second survey.

### FAMILIES PARTICIPATING IN THE LOW-PRICED-MILK PROGRAM

**WHITE FAMILIES.**—Only 72 of the 102 white families buying 5-cent milk during the program study had been buying fluid milk in the preprogram period. The program, therefore, increased by about 40 percent the number of families purchasing this product. Not all of the milk consumed was purchased, however. During both periods about 40 percent of the families also received some milk free. Most of these were families with children who got milk as part of free school lunches.

During the period covered by the preprogram survey, the 102 families bought an average of 0.98 quart of fluid milk per person per week (table 1). After 5-cent milk was available they bought about three times as much—an average of 2.89 quarts per person per week.



In the preprogram period they received an average of 0.54 quart per person per week free; during the program period, 0.28 quart. The lesser quantities of milk received free by these white families in the fall as compared with the spring was due only in part to the fewer number of children having free lunches at school. In the preprogram period 88 children in families in this group had free lunches at school; in the program period, 77. The total quantity of milk consumed (purchased and free) amounted to an average of 1.52 quarts per person per week in the preprogram period, and to 3.17 quarts after the program went into effect. Thus, the average quantity purchased increased nearly threefold between the two surveys; the average quantity consumed approximately doubled.

TABLE 1.—FLUID WHOLE MILK CONSUMPTION AND PURCHASE BY HOUSEHOLDS PARTICIPATING IN THE LOW-PRICED-MILK PROGRAM: *Average household size, number of households consuming, and average quantities of fluid whole milk, free and purchased at specified prices, consumed per person during 1 week, by race, period of interview, and household composition, 102 white and 219 Negro participating households, Washington, D. C., May-June and October-November 1940*

Race, period of interview, and household composition	Households	Average household size in persons	Households consuming fluid whole milk—		Average <sup>1</sup> quantities of fluid whole milk consumed per person during 1 week							
			Obtained free	Purchased	All milk	Obtained free	Purchased at average price per quart of—					
							Any price	5 cents	6-10 cents	11-12 cents	13-14 cents	15 cents or more
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
White households:	Number	Number	Number	Number	Quarts	Quart	Quarts	Quarts	Quart	Quarts	Quarts	Quart
Preprogram.....	102	4.98	44	72	1.52	0.54	0.98	0	0	0.37	0.54	0.07
Program.....	102	4.88	42	102	3.17	.28	2.89	2.35	.53	.01	0	0
Adults only:												
2-4 persons:												
Preprogram.....	12	2.75	0	10	1.32	0	1.32	0	0	.36	.73	.23
Program.....	12	2.50	1	12	2.43	0	2.33	1.50	.60	.23	0	0
Adults and children:												
2-4 persons:												
Preprogram.....	31	3.19	9	23	2.08	.37	1.71	0	0	.33	1.37	.01
Program.....	31	3.26	6	31	3.35	.14	3.21	2.55	.66	0	0	0
5 or more persons:												
Preprogram.....	59	6.37	35	39	1.40	.64	.76	0	0	.39	.30	.07
Program.....	59	6.22	35	59	3.17	.33	2.84	2.36	.48	0	0	0
Negro households:												
Preprogram.....	219	5.12	105	140	.93	.25	.68	0	0	.24	.40	.04
Program.....	219	5.12	121	219	2.50	.26	2.54	2.38	.16	0	0	0
Adults only:												
2-4 persons:												
Preprogram.....	15	2.40	0	9	.62	0	.62	0	0	.22	.26	.14
Program.....	15	2.47	1	15	2.76	.03	2.73	2.39	.34	0	0	0
Adults and children:												
2-4 persons:												
Preprogram.....	77	3.27	31	45	1.07	.22	.85	0	0	.22	.60	.03
Program.....	77	3.66	38	77	2.77	.23	2.54	2.20	.34	0	0	0
5 or more persons:												
Preprogram.....	127	6.56	74	86	.90	.27	.63	0	0	.24	.34	.05
Program.....	127	6.32	82	127	2.81	.28	2.53	2.44	.09	0	0	0

<sup>1</sup> Averages are based on the number of persons in households in each class (table 8).



The gain in milk consumption may be readily perceived by considering the proportion of families having a pint or more of milk per person per day. In the preprogram period only 11 percent had a pint or more of fluid milk per person per day, while as many as 13 percent had none at all; in the program period all participating families had some, and 44 percent had a pint or more of milk per person per day. (See table 9, Appendix.)

All purchased milk was bought for 11 cents or more a quart during the period of the preprogram inquiry; in the program period, about 80 percent of the purchased milk was bought for 5 cents a quart. The average price paid per quart by white families was 12.7 cents and 5.4 cents, respectively, in the two periods. Despite the lower average price, household expenditures for fluid milk were almost a fourth higher after the program went into effect than before. (See table 10, Appendix.)

Regardless of household composition, all groups of white participating families consumed more milk during the period covered by the second survey, after the low-priced milk had become available, than during the preprogram period. The increase among families composed of two to four adults was 84 percent; among families including children, the increase was 61 percent in the smaller households of two to four persons and as much as 126 percent among large families of five or more. Average quantities of milk purchased by families with children prior to the program varied from 0.76 quart per person per week in families of five or more to 1.71 quarts in families of two to four persons. Corresponding figures after the program was in operation were 2.84 and 3.21 quarts per person per week, respectively.

**NEGRO FAMILIES.**—Of the 219 Negro families participating in the 5-cent-milk program, 140, or about two-thirds, were buying fluid milk during the week of the preprogram survey; 105 of the 204 families with children received free milk. The average quantities of fluid milk purchased were nearly four times as great after the program was begun as before, increasing from 0.68 to 2.54 quarts per person per week. The quantities consumed—purchased and free—were three times greater after 5-cent milk went on sale than during the initial survey—2.80 quarts as compared with 0.93 quart per person per week.

In the preprogram period 14 percent of the 219 Negro families had no fluid milk at all, and only 2 percent had as much as a pint a person a day. After 5-cent milk became available, 33 percent had a pint or more per day for each person. The increases in average fluid milk purchases following the low-priced-milk program were threefold to fourfold, varying with family size. Families of adults including two to four persons increased their average weekly consumption of milk, purchased and free, by 345 percent; families of this same size with children, by 159 percent; families of five or more persons with children, by 212 percent.

Although the participating Negro families paid an average of 5.2 cents rather than 12.8 cents per quart for milk bought after the program was in operation, money expenditures for fluid milk were about 50 percent greater—67 cents per household per week in the program period as compared to 44 cents in the preprogram period.

COMPARISON OF QUANTITIES OF 5-CENT MILK PURCHASED WITH  
MAXIMUM ALLOWANCES UNDER THE PROGRAM

The plan for distributing low-priced milk fixed a maximum purchase allowance for each family. As a rule, the quantities of milk to be sold at the low price were not to exceed 1 pint per day for every person under 17 years of age and for every expectant or nursing mother, and  $\frac{1}{2}$  pint per day for all other persons 17 or more years of age. Additional quantities could be made available to families with special dietary needs, however.

Although the quantities of milk allowed are minimal from the standpoint of nutrition, participating white families were buying only 85 percent of their total allowances during the period covered by the program study (table 2). Negro participants were buying even less—82 percent. Only about half of the participating families bought the maximum quantities, while 14 percent of the white and 19 percent of the Negro families bought less than half as much as they were entitled to buy.

TABLE 2.—MAXIMUM ALLOWANCES COMPARED WITH ACTUAL PURCHASES OF 5-CENT MILK: *Average quantities of 5-cent milk allowed (maximum) and actually purchased per household during 1 week, percentage of maximum allowances purchased, and distribution of households purchasing specified proportions of their maximum allowances, by race and household composition, 102 white and 219 Negro households participating in the low-priced-milk program, Washington, D. C., May-June and October-November 1940*

Race and household composition	Households	Average <sup>1</sup> quantity of 5-cent milk per household during 1 week		Proportion of maximum milk allowances purchased	Households purchasing specified proportions of their maximum milk allowances				
		Maximum allowed	Actually purchased		Less than 25 percent	25-49 percent	50-74 percent	75-99 percent	100 percent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
White households.....	Number 102	Quarts 15.60	Quarts 13.22	Percent 85	Percent 3	Percent 11	Percent 14	Percent 20	Percent 52
Adults only:									
2-4 persons.....	12	7.29	5.00	69	0	34	33	0	33
Adults and children:									
2-4 persons.....	31	11.63	9.94	85	0	13	6	26	55
5 or more persons.....	59	19.37	16.62	86	5	5	14	20	56
Negro households.....	219	15.57	12.72	82	3	16	12	17	52
Adults only:									
2-4 persons.....	15	7.00	6.57	94	0	13	20	7	60
Adults and children:									
2-4 persons.....	77	11.09	8.79	79	1	21	14	17	47
5 or more persons.....	127	19.29	15.83	82	4	14	9	18	55

<sup>1</sup> Averages are based on the number of households in each class (col. 2).

Two-thirds of the families that were buying less than half of their allowances gave "insufficient money for food" as the reason for not buying more milk. Nevertheless many must have considered milk at this price a good investment; participating families spent for dairy products other than butter a larger proportion of their food money than is customary among nonrelief families. Furthermore, 81 percent of the milk bought by participating white families and 94 percent

of that bought by participating Negro families during the week covered by the second inquiry was purchased by those buying only 5-cent milk.

## FAMILIES NOT PARTICIPATING IN THE LOW-PRICED-MILK PROGRAM

**WHITE FAMILIES.**—Some fluid whole milk was purchased by about two-thirds of the nonparticipating white families during each period of study. In the preprogram survey, the quantity purchased by the 90 nonparticipants averaged 1.24 quarts per person per week (table 3). An additional amount, 0.55 quart, was received free, making the total consumed 1.79 quarts per person per week. Only 14 percent of

**TABLE 3.—FLUID WHOLE MILK CONSUMPTION AND PURCHASE BY HOUSEHOLDS NOT PARTICIPATING IN THE LOW-PRICED-MILK PROGRAM:** *Average household size, number of households consuming, and average quantities of fluid whole milk, free and purchased at specified prices, consumed per person during 1 week, by race, period of interview, and household composition, 90 white and 213 Negro nonparticipating households, Washington, D. C., May-June and October-November 1940*

Race, period of interview, and household composition  (1)	Households  (2)	Average household size persons (3)	Households consuming fluid whole milk		Average <sup>1</sup> consumption of fluid whole milk per person during 1 week							
			Obtained free (4)	Purchased (5)	All milk (6)	Obtained free (7)	Purchased at average price per quart of—					
							Any price (8)	5 cents (9)	6-10 cents (10)	11-12 cents (11)	13-14 cents (12)	15 cents or more (13)
<b>White households:</b>	<i>Num- ber</i>	<i>Num- ber</i>	<i>Num- ber</i>	<i>Num- ber</i>	<i>Quarts</i>	<i>Quart</i>	<i>Quarts</i>	<i>Quart</i>	<i>Quart</i>	<i>Quart</i>	<i>Quart</i>	<i>Quart</i>
Preprogram.....	90	3.94	30	58	1.79	0.55	1.24	0	0	0.56	0.60	0.08
Program.....	90	3.83	27	58	1.54	.43	1.11	0	.02	.50	.50	.09
<b>Adults only:</b>												
2-4 persons:												
Preprogram.....	22	2.27	0	12	1.25	0	1.25	0	0	.28	.76	.21
Program.....	22	2.18	0	13	1.00	0	1.00	0	0	.58	.32	.10
<b>Adults and children:</b>												
2-4 persons:												
Preprogram.....	42	3.52	16	28	1.90	.57	1.33	0	0	.66	.62	.05
Program.....	42	3.57	15	27	1.74	.52	1.22	0	0	.45	.66	.11
5 or more persons:												
Preprogram.....	26	6.04	14	18	1.85	.71	1.14	0	0	.56	.51	.07
Program.....	26	5.65	12	18	1.52	.49	1.03	0	.05	.53	.39	.06
<b>Negro households:</b>												
Preprogram.....	213	4.49	85	108	.67	.24	.43	0	(2)	.08	.29	.06
Program.....	213	4.46	94	78	.61	.28	.33	0	.01	.14	.15	.03
<b>Adults only:</b>												
2-4 persons:												
Preprogram.....	29	2.31	0	14	.49	0	.49	0	0	.12	.24	.13
Program.....	29	2.34	0	13	.67	0	.67	0	0	.22	.34	.11
5 persons or more:												
Preprogram.....	3	6.00	0	1	.17	0	.17	0	0	0	.17	0
Program.....	3	4.00	0	1	.04	0	.04	0	0	0	0	.04
<b>Adults and children:</b>												
2-4 persons:												
Preprogram.....	94	3.21	32	48	.80	.16	.64	0	(2)	.14	.40	.10
Program.....	94	3.37	36	38	.75	.18	.57	0	(2)	.25	.26	.06
5 or more persons:												
Preprogram.....	87	6.54	53	45	.63	.32	.31	0	0	.05	.22	.04
Program.....	87	6.34	58	26	.54	.37	.17	0	.02	.07	.07	.01

<sup>1</sup> Averages are based on the number of persons in households in each class (table 8).

<sup>2</sup> 0.005 quart or less.



these families had as much as a pint of milk a person a day; 17 percent had none at all. At the time of the second survey, the quantity bought averaged 1.11 quarts per person per week and that consumed, 1.54 quarts; as many as 22 percent used no fluid milk at all. Thus there was a decrease in the proportion of families having fluid milk as well as in average purchases and consumption between the two periods.

A decrease in consumption between the two surveys, while not large, was consistently found among all groups of nonparticipating families. Per capita purchases and consumption tended to be somewhat higher among families with only one or two children than among larger families with children or among families consisting of adults only. For no group, however, did total consumption of fluid whole milk average as much as 2 quarts per person per week.

Practically all the milk purchased in both periods was bought at 11 cents or more per quart, averaging slightly more than 12 cents per quart. Some fluid whole milk was obtained free by about 4 of every 10 of the white families with children.

**NEGRO FAMILIES.**—Only about half of the 213 nonparticipating Negro families bought any fluid milk in the preprogram period, and fewer still in the fall after 5-cent milk was available. Milk purchases usually averaged less than a pint of milk per person per week, although somewhat more was bought by the smaller families. The average price paid for milk in the preprogram period was 13.6 cents per quart and in the program period 12.6 cents. Almost half the families with children obtained some free milk in both surveys; yet the 213 families consumed an average of only 0.67 quart, including purchased and free milk, per person per week in the preprogram period, and 0.61 quart after the program was in operation.

#### REASONS FOR NONPARTICIPATION

Families eligible to buy milk at 5 cents a quart but not participating in the program at the time of the second survey were asked why they had not made use of their opportunity. Most of the reasons given may be grouped under five general headings—inconvenience of the plan; insufficient money for food; incomplete certification; lack of interest in the plan; and a customary low fluid milk consumption (table 4).

Inconvenience of the plan was the reason given most frequently by white nonparticipating families. The most common reply was "too far to walk." Other explanations were "no one to go to the milk depot," or "unable to stand in line." Among the 27 white families offering reasons in this category, over half were families with children. Relatively fewer Negro than white families appeared to find the inconveniences attached to participation of prime importance. Because distance from the distributing center was frequently named as an inconvenience which interfered with participation, the one-way distance between the milk distributing station and the house was counted in blocks for the 27 white and 20 Negro families giving this reason for nonparticipation. Of the 27 white families 5 named distance as a reason for nonparticipation even though they lived within 5 city blocks of the distributing station; 12 families giving this reason lived at a distance of 5 to 9 blocks, however, and 10 fami-



lies lived 10 or more blocks from the station. No Negro family living within 5 blocks of the station gave distance as a reason for nonparticipation; 6 of the 20 Negro families giving this reason lived from 5 to 9 blocks away and the other 14, from 10 to 14 blocks away from the station.

The place of residence of participating and nonparticipating families in relation to the location of milk stations is shown in figure 1. While there is some tendency for participation to be less frequent among those living at greater distances from the milk depots, there is no marked difference in the distribution of participants and nonparticipants by residence.

TABLE 4.—REASONS FOR NONPARTICIPATION IN THE LOW-PRICED-MILK PROGRAM:  
*Number of households not participating in the low-priced-milk program and percentage giving various types of reasons for nonparticipation, by race and household composition, 90 white and 213 Negro households, Washington, D. C., May-June and October-November 1940*

Race and household composition	Households	Proportion giving indicated reason for nonparticipation					
		Inconvenience of plan	Insufficient money for food	Incomplete certification	Lack of interest	Low fluid-milk consumption	Other
	Number	Percent	Percent	Percent	Percent	Percent	Percent
White households.....	90	30	24	16	13	8	9
Adults only.....	25	44	16	12	12	12	4
Adults and children.....	65	25	28	17	14	6	10
Negro households.....	213	9	37	34	12	6	2
Adults only.....	36	6	44	22	19	8	1
Adults and children.....	177	10	36	36	10	5	3

Apparently the program would be more acceptable to many if it were possible to establish more stations in more convenient locations, as in grocery stores. For some it would be more convenient if the depots could be open both in the morning and in the afternoon, even though for shorter periods. This would be advantageous, especially in the summer when many families have inadequate home refrigeration. Hours still could be so arranged that one group of attendants could service two stations.

Milk delivery to homes in which no member is able to go for milk might well be considered. Illness, physical disability, or a young baby might create such special cases. A change from a glass bottle to a paper carton would eliminate the required 3-cent bottle deposit and lighten the weight to be carried. The latter is of some importance when more than a couple of quarts must be carried for a considerable distance.

The reason for nonparticipation most frequently given by Negro families, but given often also by white, was "lack of enough money" or "not enough money to buy milk." This reason was offered more frequently than any other by both Negro and white families with children. Those giving this reason did in fact tend to spend less money for food than nonparticipating families taken as a whole. Food expenditures averaged \$1.00 and \$1.44 per person per week among the two groups of white families, and \$0.90 and \$1.03 per person per week among the Negro.

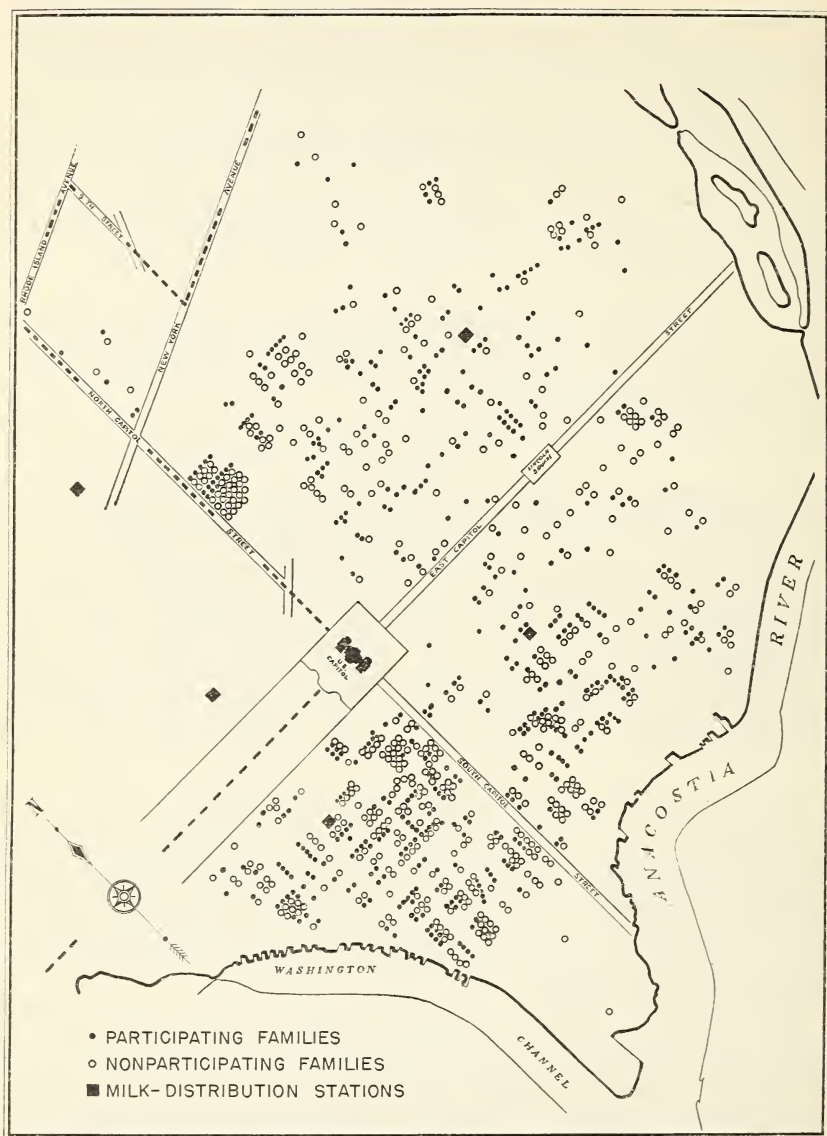


FIGURE 1.—Distribution of participating and nonparticipating families by place of residence in relation to location of convenient milk-distributing stations.

A large proportion, especially of Negro families with children, gave as reasons for nonparticipation such statements as —“identification card not yet received,” “identification card lost,” “card still unsigned because of illness.” In some instances, certification procedures seemed to be a stumbling block to participation. At present, upon becoming eligible for participation in the low-priced-milk program, families receive a mimeographed letter stating that “In cooperation with the District of Columbia Board of Public Welfare, we have

worked out a plan under which you can buy your milk at 5 cents per quart from a distributing station near your home." A list of the milk distributing stations and hours of distribution follow this. Instructions giving the steps families need to take to become participants are next. They must "fill in the enclosed self-addressed card, put a one-cent stamp on it, and drop the card in the nearest mail box, or take the card to the nearest distributing station." A second copy of the letter is sent as a follow-up if there is no response to the first. Although the procedure is simple and the letter is clear to a person accustomed to reading instructions, a printed circular with an attention-arresting lay-out probably would gain better response from the families.

Perhaps correspondence alone ought not to be relied upon to enlist participation especially since in some households neither head can read or write English, and the letter must be interpreted by a child. To such families, if not to all, it would be well if social workers would explain the program and answer questions. As part of this interview it should be pointed out that the quality of the low-priced milk is as good as that of standard milk sold by the same dairy. The field agents for this study were frequently asked about the quality of the 5-cent milk. Simple, attractive circulars describing how to get 5-cent milk could supplement the personal letter and be distributed with deliveries of surplus foods and given out in health centers, clinics, churches, community centers, and schools.

Some families submitted reasons for nonparticipation which implied that they did not recognize the importance of the opportunity to procure low-priced milk, or were unaware of their need. Thirteen percent of the white and 12 percent of the Negro families said that they were not interested in the plan, and 8 and 6 percent of the white and Negro groups, respectively, said they did not use enough fluid milk to warrant taking part in the program. They gave replies as "have not bothered to go for milk," "not interested," "neglected to send in card," "use too little," or "don't like milk."

Education as to the importance of milk as an economical source of essential food elements appears to be basic in a program designed to increase milk consumption. Many families still do not realize the economy and high returns in superior quality of protein, as well as in the calcium, other minerals, and vitamins that milk affords. They think of milk as an expensive beverage, and are not convinced that money spent for milk, even at a reduced price, buys a bargain. Although the maximum allowances to families were low in the light of present concepts of a desirable quantity of milk in the diet—yet only about half the families participating in the plan purchased their full allotments. Information on the economy and high nutritive value of milk as a food for persons of all ages could be given out in milk distributing stations and in places where members of eligible families are likely to meet, as in community centers, health and medical clinics, schools, and churches. Such centers could be used also for food demonstrations emphasizing the use of milk in cooking and in planning menus.

A few white families received milk as a gift and gave that as their reason for not buying any. A small group made no comment on their reasons for nonparticipation.



COMPARISON OF QUANTITIES ACTUALLY BOUGHT WITH  
ANTICIPATED PURCHASES OF 5-CENT MILK

Many studies of consumer reaction to a program are based on what families say they would buy were marketing arrangements different. In this study it has been possible to compare anticipated with actual performance. In the preprogram survey 604 of the 624 identical families responded to the question of how much milk they thought they would buy were it available at central depots for 5 cents a quart.

About 5 percent of the families interviewed thought they would not be interested in buying any low-priced milk; 95 percent expected to take advantage of the plan. In the period covered by the program survey, 22 of the 30 families that had not expected to participate were not buying any 5-cent milk; on the other hand, 8 were making use of the opportunity. Of the 574 families who thought they would avail themselves of the low-priced milk, only about half—53 percent—were participating in the program.

Actual purchases of 5-cent milk made by families after the program went into operation have been compared with preprogram estimates

TABLE 5.—PREPROGRAM ESTIMATES OF PURCHASE OF LOW-PRICED MILK COMPARED WITH ACTUAL PURCHASES: *Average quantities of 5-cent milk in anticipated and actual purchases and percentage of households buying specified proportions of their preprogram estimates, by race and household composition, 184 white and 420 Negro households, Washington, D. C., May-June and October-November 1940*

Race and household composition (1)	Households (2)	Households reporting an estimate of probable purchases (3)	Average <sup>1</sup> quantity of 5-cent milk per household during 1 week		Proportion of preprogram estimate actually purchased during program (6)	Distribution <sup>1</sup> of households buying specified proportions of preprogram estimates				
			Preprogram estimate (4)	Program purchase (5)		None (7)	Less than half (8)	From half to full amount (9)	Full amount but less than twice as much (10)	Twice as much or more (11)
	Number 624	Number 604	Quarts 11.08	Quarts 6.69	Per- cent 60	Per- cent 48	Per- cent 7	Per- cent 14	Per- cent 21	Per- cent 10
All households.....	192	184	11.67	7.15	61	44	7	18	22	9
White households.....	34	34	6.31	1.76	28	63	10	14	13	0
Adults only:										
2-4 persons.....	73	67	10.95	4.12	38	58	5	19	12	6
Adults and children:										
2-4 persons.....	85	83	14.45	11.81	82	26	8	19	33	14
5 or more persons.....	432	420	10.82	6.49	60	49	7	13	21	10
Negro households.....	44	41	4.38	2.40	55	62	0	9	18	11
Adults only:										
2-4 persons.....	3	3	9.33	0	0	100	0	0	0	0
Adults and children:										
2-4 persons.....	171	168	8.40	3.90	46	55	8	10	18	9
5 or more persons.....	214	208	14.07	9.47	67	40	8	15	26	11

<sup>1</sup> Averages and distribution are based on the number of households reporting in each class (col. 3).



of what they would purchase. The differences are striking. Families included in the study bought about 60 percent of the quantities anticipated, but there was extremely wide variation in behavior among the different component groups of families (table 5). Over two-thirds of the families bought less 5-cent milk than they had expected—in fact, 44 percent of the white families and 49 percent of the Negro bought none at all. On the other hand, 9 and 10 percent, respectively, bought at least twice as much as they had anticipated. Families of five or more persons were more likely than small families to buy more than they had expected.

## PURCHASE AND CONSUMPTION OF ALL DAIRY PRODUCTS AND OLEOMARGARINE

The benefits of a low-priced-milk program to consumers cannot be measured solely by the increase in the purchase or consumption of fluid whole milk. These increases may not be net gains to the diet, inasmuch as changes in the consumption of milk in other forms may follow the development of the program.

It should be emphasized, however, that not all of the differences in dairy-product consumption shown by the two surveys presented in this report are due to the operation of the low-priced-milk program. Some of the differences may be seasonal, as the consumption of ice cream. Other important differences are due to changes (reductions, as a rule) in the level of expenditures for food and for dairy products. Furthermore, the study was complicated somewhat by the occasional distribution of dry skim milk and evaporated milk and by a marked reduction in the quantities of butter distributed free to families under another program of the Surplus Marketing Administration. Still other differences are due to changes in the proportion of families receiving free fluid milk from late spring to early fall, and in the average quantities received free. In view of the problems involved it seems well merely to record the findings of the study in terms of overall differences in the diet, with no attempt to indicate what proportion of the shifts in consumption are due to the low-priced-milk program and what proportion to other factors.

Expenditures for dairy products are closely related to economic status—the higher the income, the larger the outlay tends to be. Among nonrelief village and city families expenditures for food to be prepared and served at home averaged \$1.65 per person per week in 1935–36 when family incomes for the year were in the class, \$500–\$999, and \$2.80 when incomes were in the class \$3,000–\$3,999. Of these sums spent for food 22 and 23 percent, respectively, were spent for dairy products.<sup>2</sup>

Among the 624 identical families included in this study, money expenditures for food averaged almost \$1.15 per person per week in the periods covered by each survey. In the preprogram period about a fifth of this sum (21 percent) was spent for dairy products (table 6). This is almost as large a proportion as nonrelief families customarily spend for these foods. In the fall when the program survey was made, participants in the program were investing about the same proportion in these products as in the earlier period, but

<sup>2</sup> Unpublished data, U. S. Bureau of Home Economics.

nonparticipants were spending a smaller proportion of their food money for dairy products.

Participants spent fewer dollars for all dairy products, but more for fluid milk and butter in the fall than in the late spring. The larger outlays for these two products during the period of the program inquiry were possible through a reduction in expenditures for evaporated milk and milk in such other forms as cheese and ice cream.

TABLE 6.—MONEY EXPENDITURES FOR DAIRY PRODUCTS: *Average money expenditures for all food, all dairy products, and specified products per household during 1 week, 624 identical households, by race, participation in the low-priced-milk program, and period of interview, Washington, D. C., May-June and October-November 1940*

Race, participation, and period of interview	Households	Average household size in persons	Average <sup>1</sup> money expenditures for—							Proportion of food money spent for dairy prod- ucts	Distribution of money spent for dairy prod- ucts among—				
			All food	Dairy products					Other		Fluid whole milk	Evaporated milk	Butter	Other	
				All	Fluid whole milk	Evaporated milk	Butter	Other							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		
All households:	<i>Num- ber</i>	<i>Num- ber</i>	<i>Dol- lars</i>	<i>Dol- lars</i>	<i>Dol- lar</i>	<i>Dol- lar</i>	<i>Dol- lar</i>	<i>Dol- lar</i>	<i>Per- cent</i>	<i>Per- cent</i>	<i>Per- cent</i>	<i>Per- cent</i>	<i>Per- cent</i>		
Preprogram.....	624	4.71	5.40	1.14	0.43	0.20	0.15	0.36	21	37	18	13	32		
Program, all.....	624	4.67	5.31	.99	.50	.12	.19	.18	19	51	12	19	18		
Participants.....	321	5.05	5.67	1.19	.70	.09	.21	.19	21	58	8	18	16		
Nonparticipants.....	303	4.27	4.92	.79	.29	.16	.17	.17	16	36	20	22	22		
White households:															
Participants:															
Preprogram.....	102	4.98	5.69	1.39	.62	.21	.16	.40	24	44	15	12	29		
Program.....	102	4.88	5.88	1.29	.76	.12	.20	.21	22	59	9	16	16		
Nonparticipants:															
Preprogram.....	90	3.94	5.46	1.32	.60	.14	.20	.38	24	45	11	15	29		
Program.....	90	3.83	5.56	1.11	.53	.16	.22	.20	20	48	14	20	18		
Negro households:															
Participants:															
Preprogram.....	219	5.12	5.74	1.18	.44	.24	.14	.36	21	38	20	12	30		
Program.....	219	5.12	5.57	1.15	.67	.08	.22	.18	21	58	7	19	16		
Nonparticipants:															
Preprogram.....	213	4.49	4.88	.89	.26	.19	.13	.31	18	29	21	15	35		
Program.....	213	4.46	4.65	.64	.19	.16	.14	.15	14	30	25	22	23		

<sup>1</sup> Averages, except in column 4, are based on the number of households in each class (col. 2); averages in column 4 are based on the number of households reporting expenditures for food during 1 week.

Nonparticipants also spent less money for dairy products in the fall than in the late spring, but the distribution of these dollars was different from that of participants. In the fall the nonparticipating families spent considerably smaller proportions of their outlays for dairy products on fluid milk than did participants, but relatively more on other products, especially evaporated milk.

## FLUID MILK AND ITS EQUIVALENT IN NONFAT MILK SOLIDS

Because shifts in expenditures for fluid milk were accompanied by shifts in expenditures for other milk products, account must be taken not only of the consumption of fluid whole milk but of all milk products—both free and purchased—if one is to judge the total effect of the low-priced-milk program on the richness of the diet in milk solids.

Attention should be focused on its effect on the diet insofar as nonfat solids are concerned, since it is this portion of the milk that makes special contributions to the calcium and riboflavin content of the diet, two nutrients in which diets of low-income families often are in great need of improvement.

In evaluating the total consumption of nonfat milk solids, the quantities of products such as evaporated, chocolate, sweetened condensed, or dry skim milk, cream, ice cream, and cheeses of all kinds were converted to a "fluid-milk equivalent." This was done by applying appropriate factors to the estimated weights of the various dairy products. For example, if a family used two 14½-ounce cans of evaporated milk, that evaporated milk was considered equivalent in nutritive value to about 1.7 quarts of fluid milk—17 ounces of evaporated milk contain about as much protein and minerals as 1 quart of milk. (See footnote 2, table 7.)

TABLE 7.—CONSUMPTION OF DAIRY PRODUCTS AND OLEOMARGARINE: *Average quantities of milk in specified forms, butter, purchased and free, and oleomargarine consumed per household during 1 week, 624 identical households, by race, participation in the low-priced-milk program, and period of interview, Washington, D. C., May-June and October-November 1940*

Race, participation, and period of interview  (1)	Households (2)	Average household in persons (3)	Average <sup>1</sup> quantity of—								
			Milk or its equivalent <sup>2</sup> in non-fat milk solids					Butter			Oleomargarine (12)
			In any form (equivalent) (4)	As purchased fluid whole milk (5)	As free fluid whole milk (6)	As evaporated milk (7)	In other form (equivalent) (8)	From any source (9)	Purchased (10)	Free (11)	
	No.	No.	Qt.	Qt.	Qt.	Lb.	Qt.	Lb.	Lb.	Lb.	Lb.
All households:	624	4.71	9.39	3.37	1.58	2.57	2.02	0.81	0.42	0.39	0.18
Preprogram .....	624	4.67	13.48	8.00	1.35	1.53	2.69	.55	.54	.01	.25
Program, all .....											
Participants .....	321	5.05	18.48	13.36	1.33	1.20	2.66	.62	.61	.01	.30
Nonparticipants .....	303	4.27	8.18	2.31	1.37	1.88	2.73	.49	.48	.01	.20
White households:											
Participants:											
Preprogram .....	102	4.98	12.44	4.88	2.72	2.91	2.10	.96	.48	.48	.32
Program .....	102	4.88	19.82	14.09	1.37	1.61	2.85	.60	.60	(3)	.54
Nonparticipants:											
Preprogram .....	90	3.94	11.05	4.88	2.18	1.75	2.35	.81	.59	.22	.21
Program .....	90	3.83	9.67	4.25	1.66	1.92	1.96	.67	.67	0	.27
Negro households:											
Participants:											
Preprogram .....	219	5.12	9.66	3.46	1.28	3.02	2.08	.86	.39	.47	.16
Program .....	219	5.12	17.85	13.02	1.32	1.00	2.57	.62	.61	.01	.19
Nonparticipants:											
Preprogram .....	213	4.49	6.95	1.91	1.08	2.30	1.80	.70	.36	.34	.12
Program .....	213	4.46	7.55	1.49	1.24	1.86	3.07	.41	.40	.01	.16

<sup>1</sup> Averages are based on the number of households in each class (col. 2).

<sup>2</sup> In cheese, dry milk or evaporated milk. 5 ounces of American (Cheddar) cheese, or 1 quart of skim milk, or 4½ ounces of dry whole milk, or 3½ ounces of dry skim milk, or 17 ounces of evaporated milk are about equivalent in nonfat milk solids to 1 quart of fluid whole milk.

<sup>3</sup> 0.005 pound or less.

Among participating white families, the level of consumption was equivalent in nonfat milk solids to 12.44 quarts of fluid milk per household per week before the inauguration of the low-priced-milk program, and to 19.82 quarts afterward (table 7). The participating Negro families used somewhat less milk than did the white—averaging



9.66 and 17.85 quarts or its equivalent in nonfat solids per household per week in the two periods. Thus, through the program the diets of both white and Negro families were greatly improved with respect to milk, with the Negroes benefiting relatively more because of their lower dietary levels in the preprogram period.

Of the families that took advantage of 5-cent milk when it became available, 67 percent of the white and 55 percent of the Negro had milk in some form—fluid, evaporated milk, or cheese—in quantities equivalent to the nonfat milk solids found in a pint or more of fluid milk per person per day. Prior to the program the diets of only 27 and 13 percent, respectively, included as much.

Among nonparticipating white families the consumption of nonfat milk solids was equivalent to 11.05 quarts of milk prior to the program and to 9.67 quarts afterward. Corresponding figures for Negro nonparticipants were lower—6.95 and 7.55 quarts, respectively. During the program period, 13 percent of the Negro nonparticipants consumed milk or its equivalent in nonfat solids in quantities totaling a pint or more of fluid milk a person a day; in the preprogram period, only 8 percent of the families had as much. White nonparticipants fared better than Negro in both periods—29 percent consumed milk in all forms in quantities equivalent in nonfat solids to a pint or more of fluid milk per person per day.

In the preprogram period 17 percent of the nonfat milk solids consumed by the 624 families was received free. After 5-cent milk became available, 14 percent of the total consumed by participants and 33 percent of the total consumed by nonparticipants were obtained free. Free fluid milk was received chiefly through the school lunch program, although a few families received milk as a gift from friends and relatives. Free milk came to family groups largely from the direct distribution program. Dry skim milk and evaporated milk were distributed free as a surplus commodity in Washington, D. C., during September 1940. Many families were still using their supply of these products during October and November. These free products, especially the dry skim milk, increased milk consumption in all forms during the program period as compared with the preprogram among both white and Negro participants and Negro nonparticipants, despite a decrease in money expenditures (tables 6 and 7).

#### EVAPORATED MILK

For many low-income families throughout the country evaporated milk provides a safe, inexpensive, milk supply. It is of interest to note, therefore, that after the low-priced-milk program was started a smaller proportion of the participating families continued to use evaporated milk, and that the average quantities consumed per participating household usually were smaller than during the period covered by the first survey. Almost 80 percent of the 102 white participating families used some evaporated milk in the preprogram study, while fewer than 60 percent were using it after the 5-cent milk became available. The average quantity consumed weekly by the 102 families decreased from 2.9 to 1.6 pounds per household between the first and second periods. The average quantities used by those purchasing this product were 3.8 and 2.9 pounds per household, respectively, in the two periods.



Evaporated milk was used by relatively fewer Negro than white families participating in the program. Among the 219 participating Negro families the average quantities consumed were only one-third as large during the week covered by the follow-up survey as in the preprogram inquiry. The average quantity bought by those continuing to use it was 2.7 pounds per household per week as compared with an average of 4.1 pounds bought by the 219 families in the preprogram period.

## BUTTER AND OLEOMARGARINE

The consumption of butter and oleomargarine was affected both directly and indirectly by a marked increase in butter prices between the periods covered by the two surveys. This shift, which according to the United States Bureau of Labor Statistics, amounted to 8.6 percent in Washington, D. C., was reflected in the quantities of butter given free to needy families as a surplus commodity under the direct distribution program. During the period covered by the earlier survey, 39,952 pounds of butter were distributed in the District of Columbia; in the later, only 9,819 pounds.

The 624 identical families included in this study received an average of 0.39 pound of free butter per household per week during the period of the preprogram inquiry as compared with 0.01 pound during the time of the later survey. Participants and nonparticipants, both white and Negro, bought more butter during the program than during the preprogram period, averaging 0.54 and 0.42 pound per household per week, respectively, but their total consumption (free and purchased) averaged only 0.55 pound per household per week in the later period as compared to 0.81 pound in the earlier.

Oleomargarine purchases by the 624 families averaged 0.18 and 0.25 pound, respectively, per household per week during the two periods surveyed. The increase in oleomargarine consumption compensated only in part for the decrease in consumption of butter, noted above.

The increase in average purchases of oleomargarine among white families during the program as compared with the preprogram period was due to slightly larger weekly quantities purchased per family using the product— $1\frac{1}{2}$  pounds as compared to  $1\frac{1}{4}$ —as well as to a higher proportion of families buying oleomargarine. Among Negro families the quantity purchased by those using the product averaged a little less than  $1\frac{1}{4}$  pounds per family per week during both periods. The higher averages for the program period were due largely to an increase in the proportion of Negro families buying oleomargarine. Oleomargarine was bought by 14 percent of all families during the period covered by the preprogram inquiry and by 18 percent during the program survey. Relatively more of the large than of the small families bought this product.

The increased expenditures for butter and oleomargarine in the program period probably absorbed some of the money that otherwise would have been spent for milk. Hence, the increases in the purchase of fluid and evaporated milk may have been less than would have occurred had no changes been made in the program of direct distribution of butter.

## EFFECT OF SHIFT IN CONSUMPTION ON DIETARY LEVELS OF PARTICIPANTS

Not all of the foods purchased or received under surplus food disposal programs are consumed in addition to the customary diet. Among participants included in this study, 5-cent milk not only replaced most of the fluid milk customarily bought through usual retail outlets but resulted in a decrease in the average purchases of evaporated milk. Nevertheless there was a marked net gain in the consumption of milk in all forms. The net increase in milk consumption might have been even larger had not a reduction in free distribution of butter resulted in the allocation of an increased proportion of money spent for dairy products to butter and oleomargarine.

No information is available regarding the shifts other than in dairy products that participating families may have made in their diets in consequence of the 5-cent-milk program and the decrease in the amount of butter distributed free. If we assume that no shifts in dietary patterns occurred apart from those shown on the schedule (which covered only dairy products and oleomargarine), the net average change in consumption of nonfat milk solids was equivalent to an increase of 7.38 quarts of milk per household per week among white families, and 8.19 quarts among Negro—an increase of about 60 percent for the former, and 85 percent for the latter. On the other hand, there was a decrease in butter consumption averaging 0.36 pound among the white families and 0.24 pound among Negro families—reductions of somewhat more than a third and a fourth, respectively.

The effect on the nutritive value of the diet of such shifts in consumption would be chiefly in calcium, riboflavin, and vitamin A. The increase in the quantity of whole milk consumed more than offset the decreases in butter and evaporated milk, so far as vitamin A is concerned, while the net additions to the diet in calcium would be equivalent to about one-fourth of the family's total requirements, and in riboflavin, to about one-fifth. There also would be some net addition in food-energy value, in high-quality protein, in phosphorus and other minerals, as well as in other vitamins. Milk reinforces the diet at many points. The average quantities of milk (free and purchased) consumed by participants after the 5-cent-milk program went into effect correspond roughly to quantities recommended for a carefully chosen low-cost diet.

## SIGNIFICANT FINDINGS

The low-priced-milk program in Washington, D. C., resulted in a notable increase in the average quantity of milk consumed by the low-income families, according to data from a group of 624 identical families, each of which cooperated in surveys made before and after the program was started. In the preprogram period (May and June 1940) these families bought an average of 0.72 quart of fluid milk per person per week; their consumption of milk in various forms—purchased and free—was equivalent in nonfat milk solids to 1.99 quarts of fluid milk per person per week.

Only a few more than half of these 624 eligible families were partic-

ipating in the milk program at the time of the second interview (October and November 1940). The 321 participants bought an average of 2.65 quarts of fluid milk per person per week, the 303 nonparticipants, 0.54 quart. Consumption of milk in all forms, including purchased and free products, was equivalent in nonfat milk solids to 3.66 and 1.92 quarts per person per week among participants and nonparticipants, respectively.

Some differences in the response of white and Negro families were observed. Among the 102 participating white families, the average per capita consumption of milk in all forms—purchased and free—increased by 62 percent between the first and second surveys, while the quantities of fluid whole milk bought increased nearly threefold—from 0.98 to 2.89 quarts per person per week. Among the 219 participating Negro families, the average consumption of milk in all forms—purchased and free—increased by 84 percent. The quantities of whole fluid milk purchased by Negro families almost quadrupled, increasing from 0.68 to 2.54 quarts per person per week.

Striking as are the increases in fluid milk purchases of participating families, only about half of the participants bought the maximum quantities allowed under the low-priced-milk program; more than one-fourth bought less than 75 percent of their allowance.

Among participants in the program the increase in fluid milk consumption more than offset a lessened use of milk in other forms, such as evaporated milk, so that their total consumption of milk in all forms increased markedly. Among nonparticipants, on the other hand, purchases of fluid milk tended to be smaller in the fall than in the late spring; their average consumption of milk in all forms—free and purchased combined—changed but little, however, due in part to the receipt of free dry skim milk and evaporated milk as surplus commodities under the direct distribution program.

Reasons given by families for nonparticipation in the low-priced-milk program may be grouped under five general headings—inconvenience of the plan; insufficient money for food; incomplete certification; lack of interest in the plan; and a customary low fluid milk consumption. Inconvenience of the plan was the reason most frequently given by white nonparticipating families. Apparently the program would be more acceptable to many if it were possible to establish more distributing stations in more convenient locations, as in grocery stores. The reason for nonparticipation most frequently given by Negro families—but given often by white families also—was insufficient funds for food. Those giving this reason did in fact tend to spend less money for food than did nonparticipating families taken as a group. However, education as to the importance of milk as an economical source of essential food elements appears to be a needed basic approach. Many do not realize that milk is a highly nutritious food, but still think of it as an expensive beverage.

A marked reduction in the quantities of butter distributed free as a surplus product during the period covered by the program inquiry, as compared with the earlier survey, led to an increase in purchases both of butter and oleomargarine. While these increases were insufficient to offset curtailment in consumption of table fats following the reduction in free distribution of butter, the increased expenditures consequent upon these purchases probably reduced somewhat the amounts of money available for milk, and therefore obscured the



influence of the 5-cent-milk program on participants' purchases of fluid whole milk.

Information is not at hand on the nutritive value of the diet of the low-income families eligible to buy 5-cent milk. It may be surmised from their average expenditures for food, coupled with knowledge of the diets of comparable low-income city groups, that the diets of a large proportion of the families eligible for 5-cent milk were inadequate—especially in calcium and in riboflavin. Milk is an economical source of these nutrients. The average quantities of milk in all forms, purchased and free, consumed by participating families after the low-priced-milk program went into effect correspond roughly to the quantities necessary for low-cost adequate diets in which other foods also are wisely chosen for quantity and kind.

# APPENDIX

TABLE 8.—MONEY EXPENDITURES FOR ALL FOOD AND FOR FLUID WHOLE MILK AND CONSUMPTION OF PURCHASED FLUID WHOLE MILK AND OF NONFAT MILK SOLIDS IN ANY FORM: *Number of households and persons included in the study, average money expenditures per person during 1 week for all food and for fluid whole milk and average quantities of purchased fluid whole milk and of nonfat milk solids in any form consumed per person during 1 week, all households, identical households, and households interviewed in but a single survey, by race, period of interview, and participation in the low-priced-milk program, Washington, D. C., May-June and October-November 1940*

Race, period of interview, and participation  (1)	House- holds  (2)	Persons  (3)	Average <sup>1</sup> money ex- penditures per person during 1 week		Average <sup>1</sup> quantity consumed per person during 1 week	
			All food  (4)	Fluid whole milk  (5)	Pur- chased fluid whole milk  (6)	Milk equiv- alent <sup>2</sup> of all dairy products other than butter  (7)
	<i>Number</i>	<i>Number</i>	<i>Dollars</i>	<i>Dollar</i>	<i>Quarts</i>	<i>Quarts</i>
All households:						
In preprogram survey.....	1, 101	4, 961	1. 21	0. 10	0. 79	1. 98
In follow-up or program survey:						
Participants.....	474	2, 315	1. 11	. 13	2. 55	3. 58
Nonparticipants.....	477	1, 979	1. 18	. 07	. 57	1. 88
Identical households:						
In preprogram survey.....	624	2, 940	1. 14	. 09	. 72	1. 99
In follow-up or program survey:						
Participants.....	321	1, 620	1. 13	. 14	2. 65	3. 66
Nonparticipants.....	303	1, 294	1. 14	. 07	. 54	1. 92
White households:						
In preprogram survey:						
All.....	368	1, 622	1. 39	. 16	1. 26	2. 72
Identical:						
Becoming participants.....	102	508	1. 13	. 12	. 98	2. 50
Not becoming participants.....	90	355	1. 37	. 15	1. 24	2. 80
Single interview.....	176	759	1. 59	. 19	1. 45	2. 83
In follow-up or program survey:						
Participants:						
All.....	157	766	1. 20	. 15	2. 78	3. 99
Identical.....	102	498	1. 19	. 16	2. 89	4. 06
Single interview.....	55	268	1. 21	. 13	2. 58	3. 85
Nonparticipants:						
All.....	141	550	1. 49	. 13	1. 08	2. 47
Identical.....	90	345	1. 44	. 14	1. 11	2. 52
Single interview.....	51	205	1. 56	. 12	1. 02	2. 37
Negro households:						
In preprogram survey:						
All.....	733	3, 339	1. 12	. 07	. 56	1. 62
Identical:						
Becoming participants.....	219	1, 121	1. 11	. 09	. 68	1. 89
Not becoming participants.....	213	956	1. 09	. 06	. 43	1. 55
Single interview.....	301	1, 262	1. 15	. 07	. 55	1. 44
In follow-up or program survey:						
Participants:						
All.....	317	1, 549	1. 07	. 13	2. 46	3. 39
Identical.....	219	1, 122	1. 10	. 13	2. 54	3. 48
Single interview.....	98	427	1. 00	. 11	2. 19	3. 13
Nonparticipants:						
All.....	336	1, 429	1. 07	. 05	. 37	1. 65
Identical.....	213	949	1. 03	. 04	. 33	1. 69
Single interview.....	123	480	1. 13	. 05	. 44	1. 56

<sup>1</sup> Averages, except in column 4, are based on the number of persons in each class (col. 3); averages in column 4 are based on the number of persons in households reporting expenditures for food during 1 week.

<sup>2</sup> Includes nonfat milk solids in any form, free or purchased. 5 ounces of American (Cheddar) cheese, or 1 quart of skim milk, or 4½ ounces of dry whole milk, or 3½ ounces of dry skim milk, or 17 ounces of evaporated milk are about equivalent in nonfat milk solids to 1 quart of fluid whole milk.

TABLE 9.—MILK CONSUMPTION (IN CUPS): *Average consumption of fluid whole milk and of milk or its equivalent in nonfat milk solids, and percentage of households with specified consumption in 8-ounce cups, per person during 1 week, 624 identical households, by race, participation in the low-priced-milk program, and period of interview, Washington, D. C., May-June and October-November 1940*

Race, participation, and period of interview	Households	Average <sup>1</sup> quantity per person during 1 week	Distribution <sup>1</sup> of households with specified consumption per person during 1 week				
			None	Some but less than 7 cups	7-13 cups	14-20 cups	21 or more cups
	FLUID WHOLE MILK						
	<i>Number</i>	<i>Cups</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
All households:							
Preprogram .....	624	4.2	20	56	19	5	( <sup>2</sup> )
Program .....	624	8.0	14	32	33	20	1
Participants .....	321	11.6	0	14	49	35	2
Nonparticipants .....	303	3.4	29	51	16	4	( <sup>2</sup> )
White households:							
Participants:							
Preprogram .....	102	6.1	13	42	34	11	0
Program .....	102	12.7	0	12	44	40	4
Nonparticipants:							
Preprogram .....	90	7.2	17	40	29	13	1
Program .....	90	6.2	22	38	29	10	1
Negro households:							
Participants:							
Preprogram .....	219	3.7	14	69	15	2	( <sup>2</sup> )
Program .....	219	11.2	0	15	52	32	1
Nonparticipants:							
Preprogram .....	213	2.7	30	56	12	2	0
Program .....	213	2.5	32	57	10	1	0
	MILK OR ITS EQUIVALENT <sup>3</sup> IN NONFAT MILK SOLIDS						
All households:							
Preprogram .....	624	8.0	2	48	34	11	5
Program .....	624	11.5	3	27	31	29	10
Participants .....	321	14.6	0	8	33	44	15
Nonparticipants .....	303	7.7	5	48	29	12	6
White households:							
Participants:							
Preprogram .....	102	10.0	1	29	43	21	6
Program .....	102	16.2	0	5	28	43	24
Nonparticipants:							
Preprogram .....	90	11.2	2	35	34	17	12
Program .....	90	10.1	3	31	37	17	12
Negro households:							
Participants:							
Preprogram .....	219	7.5	1	49	37	10	3
Program .....	219	13.9	0	10	35	44	11
Nonparticipants:							
Preprogram .....	213	6.2	3	62	27	5	3
Program .....	213	6.8	6	55	26	10	3

<sup>1</sup> Averages and distributions are based on the number of persons in households in each class (table 8).<sup>2</sup> 0.5 percent or less.<sup>3</sup> In cheese, dry milk, or evaporated milk. 5 ounces of American (Cheddar) cheese, or 1 quart of skim milk, or 4½ ounces of dry whole milk, or 3½ ounces of dry skim milk, or 17 ounces of evaporated milk are about equivalent in nonfat milk solids to 1 quart of fluid whole milk.



TABLE 10.—MONEY EXPENDITURES AND PRICES PAID FOR FLUID WHOLE MILK:  
Average money expenditures per household during 1 week and average price paid per quart of fluid whole milk purchased at specified prices, 624 identical families, by race, participation in the low-priced-milk program, and period of interview, Washington, D. C., May-June and October-November 1940

Race, participation, and period of interview	House- holds	Fluid whole milk purchased at average price per quart of—					
		Any price	5 cents	6-10 cents	11-12 cents	13-14 cents	15 cents or more
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AVERAGE MONEY EXPENDITURES PER HOUSEHOLD DURING 1 WEEK						
All households: Preprogram----- Program, all-----	<i>Number</i> 624 624	<i>Dollar</i> 0. 43 . 50	<i>Dollar</i> 0 . 30	<i>Dollar</i> (1) 0.05	<i>Dollar</i> 0. 13 .06	<i>Dollar</i> 0. 26 .07	<i>Dollar</i> 0. 04 .02
Participants----- Nonparticipants-----	321 303	.70 .29	.60 0	.10 .01	(1) .11	0 .14	0 .03
White households: Participants: Preprogram----- Program-----	102 102	.62 .76	0 .57	0 .18	.21 .01	.36 0	.05 0
Nonparticipants: Preprogram----- Program-----	90 90	.60 .53	0 0	0 .01	.25 .21	.30 .26	.05 .05
Negro households: Participants: Preprogram----- Program-----	219 219	.44 .67	0 .61	0 .06	.13 0	.27 0	.04 0
Nonparticipants: Preprogram----- Program-----	213 213	.26 .19	0 0	(1) .01	.04 .07	.18 .09	.04 .02
	AVERAGE PRICE PAID PER QUART						
All households: Preprogram----- Program-----	<i>Number</i> 624 624	<i>Cents</i> 12. 8 6. 3	<i>Cents</i> ----- 5. 0	<i>Cents</i> 10. 0 7. 4	<i>Cents</i> 11. 1 10. 8	<i>Cents</i> 13. 5 13. 4	<i>Cents</i> 15. 6 15. 9
Participants----- Nonparticipants-----	321 303	5. 3 12. 5	5. 0 -----	7. 3 10. 0	11. 0 11. 1	----- 13. 4	----- 15. 9
White households: Participants: Preprogram----- Program-----	102 102	12. 7 5. 4	----- 5. 0	----- 7. 1	11. 2 11. 0	13. 3 -----	15. 2 -----
Nonparticipants: Preprogram----- Program-----	90 90	12. 4 12. 5	----- -----	----- 10. 0	11. 1 11. 1	13. 2 13. 4	15. 5 15. 5
Negro households: Participants: Preprogram----- Program-----	219 219	12. 8 5. 2	----- 5. 0	----- 7. 6	11. 1 -----	13. 5 -----	15. 6 -----
Nonparticipants: Preprogram----- Program-----	213 213	13. 6 12. 6	----- -----	10. 0 10. 0	11. 3 11. 1	13. 8 13. 4	15. 8 16. 2

<sup>1</sup> \$0.005 or less.

## FRONT OF MILK SCHEDULE

1. Color	2. Collection	3. Household type	4. Participation	5. Section	6. Relief status											
BHE 802 (4/15/40)																
The information given will be strictly confidential, and will be seen only by sworn employees. It will not be used for determining eligibility for relief.																
U. S. DEPARTMENT OF AGRICULTURE BUREAU OF HOME ECONOMICS																
MILK CONSUMPTION STUDY																
Washington, D. C.																
MILK SCHEDULE																
12. (a)	Are you getting as much milk, buttermilk, skim milk, and chocolate milk as you think your family needs?				(✓) Yes											
(b)	If "No," why not?															
13.	How much money did you spend for food (including milk) last week? \$															
14.	Did you receive surplus foods during the last month?				(✓) Yes No											
15. (a)	How many persons ate at home regularly last week?															
(b)	Number of persons: (1) 17 or more years (2) Under 17 years															
(c)	Number of persons at each age under 17 years (Encircle ages of children getting free school lunches):															
Under-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

16. How much milk do you think you will buy at 5 cents a quart? ----- per week.

# SUBSTITUTE QUESTIONS USED IN PROGRAM INQUIRY

12. (a) Do you buy any 5-cent-a-quart milk at a distributing station? (✓) Yes ----- No -----

(1) If "Yes," how much do you usually buy? ----- quarts a day.

a. What is the maximum quantity allowed for your family? ----- quarts a day.

b. (If quantities purchased and allowed are identical) How much more milk (if any) would you buy if no maximum were set?

c. -----quarts a day.

(If quantity purchased is less than maximum allowed.) Why do you not buy the maximum quantity allowed for your family? -----

(2) If "No", why not? -----

14. (a) Did you receive surplus foods during the last month? (✓) Yes ----- No -----

(b) Are you getting any help from the Public Assistance Division? Yes ----- No -----

(c) Is someone in your family waiting for a WPA work assignment? Yes ----- No -----



		Code if from store, milkman R, G, P, L, FSCC (b)	Milk products consumed				To be filled in office			
			At home		Away from home		Weight, pounds (g)	Factor (h)	Milk equivalent, quarts (i)	Money value (j)
			Quantity (give unit) (c)	Price per unit (cents) (d)	Quantity (give unit) (e)	Price per unit (cents) (f)				
17. Consumption in 7 days: From ----- To -----										
(a)										
Milk:										
(1)	Whole: 5-cent	xx		5, qt.		xx	xx	xx	xx	\$
(2)	Ordinary							xx	xx	
(3)	Special (specify)							xx	xx	
(4)	Buttermilk					xx	xx	xx	xx	
(5)	Skim							xx	xx	
(6)	Chocolate							xx	xx	
(7)	Evaporated								0.43	
(8)	Condensed (sweetened)					xx	xx		.94	
(9)	Dry skim					xx	xx		1.11	
(10)	Other (specify)					xx	xx		4.57	
Cream, cheese:										
(11)	Cream					xx	xx		.33	
(12)	Ice cream								.34	
(13)	Cheese: Cottage					xx	xx		2.63	
(14)	Other					xx	xx		3.20	
(15)	Milk equivalent	xx	per qt.			xx	xx	xx	Total	
(16)	Fluid whole milk (1-3)	xx	per qt.			xx	xx	xx	Total	
(17)	Butter					xx	xx	xx	xx	xx
(18)	Oleomargarine					xx	xx	xx	xx	xx



